WHAT IS CLAIMED IS:

1.   A gateway device for carrying out a data relaying at a
transport or upper layer between a first terminal device
5 and a second terminal device which are capable of carrying
out communications through networks, the gateway device
comprising:
     a security information management unit configured to
manage information regarding a security association set up
10 between the first terminal device and the second terminal
device in order to carry out communications with guaranteed
data secrecy between the first terminal device and the
second terminal device;
     a data decryption unit configured to obtain decrypted
15 data by decrypting encrypted data received from the first
terminal device or the second terminal device, by utilizing
the information regarding the security association at a
time of relaying the communications with guaranteed data
secrecy between the first terminal device and the second
20 terminal device;
     a data relay unit configured to carry out the data
relaying at the transport or upper layer according to the
decrypted data; and
     a data encryption unit configured to encrypt data to
25 be transmitted from the gateway device by utilizing the
information regarding the security association.

2.   The gateway device of claim 1, wherein the gateway
device carries out the data relaying between the first
30 terminal device which is a radio terminal device
accommodated in a radio network and the second terminal
device which is a wired terminal device accommodated in a
wired network.

35 3.   The gateway device of claim 1, wherein the security

information management unit manages the information regarding the security association which is provided from the first terminal device or the second terminal device.

5   4.   The gateway device of claim 1, wherein the security information management unit manages the information regarding the security association which is provided from a security server for managing security of the data at a time of carrying out the communications of the data of the
10   transport or upper layer between the first terminal device and the second terminal device.

5.   The gateway device of claim 1, wherein the security information management unit manages the information
15   regarding the security association which is generated by a security server for managing security of the data and distributed from the security server to the first terminal device and the second terminal device.

20   6.   The gateway device of claim 1, wherein the security information management unit manages the information regarding the security association which is retrieved from a database by a security server for managing security of the data by using a retrieval key provided with respect to
25   the first terminal device and the second terminal device.

7.   The gateway device of claim 1, wherein the first terminal device is a mobile terminal device, and the gateway device further comprises:
30   a handoff control unit configured to transfer the information regarding the security association to a next gateway device when the first terminal moves from an area covered by the gateway device to an area covered by the next gateway device, and to control an operation of the
35   gateway device according to the information regarding the

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security association which is transferred from a previous gateway device when the first terminal moves from an area of the previous gateway device to an area covered by the gateway device.

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8.   The gateway device of claim 7, wherein the handoff control unit controls the operation of the gateway device also according to a state of the transport or upper layer.

10   9.   The gateway device of claim 1, further comprising:
          a processing unit configured to obtain decapsulated data by decapsulating encapsulated data received from the first terminal device or the second terminal device, judge whether the data relaying at the transport or upper layer
15   is necessary or not according to the decapsulated data, control the data relay unit to carry out the data relaying at the transport or upper layer when the data relaying at the transport or upper layer is judged as necessary, and encrypt data to be transmitted from the gateway device.

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10.   A gateway device for carrying out a data relaying at a transport or upper layer between a first terminal device and a second terminal device which are capable of carrying out communications through networks, the gateway device
25   comprising:
          a security information management unit configured to manage information regarding a security association set up between the first terminal device and the second terminal device in order to carry out communications with guaranteed
30   data authenticity between the first terminal device and the second terminal device;
          a data relay unit configured to carry out the data relaying at the transport or upper layer; and
          an authentication information attaching unit
35   configured to attach authentication information to data to

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be transmitted from the gateway device by utilizing the information regarding the security association.

11. The gateway device of claim 10, wherein the gateway device carries out the data relaying between the first terminal device which is a radio terminal device accommodated in a radio network and the second terminal device which is a wired terminal device accommodated in a wired network.

12. The gateway device of claim 10, wherein the security information management unit manages the information regarding the security association which is provided from the first terminal device or the second terminal device.

13. The gateway device of claim 10, wherein the security information management unit manages the information regarding the security association which is provided from a security server for managing security of the data at a time of carrying out the communications of the data of the transport or upper layer between the first terminal device and the second terminal device.

14. The gateway device of claim 10, wherein the security information management unit manages the information regarding the security association which is generated by a security server for managing security of the data and distributed from the security server to the first terminal device and the second terminal device.

15. The gateway device of claim 10, wherein the security information management unit manages the information regarding the security association which is retrieved from a database by a security server for managing security of the data by using a retrieval key provided with respect to

the first terminal device and the second terminal device.

16.   The gateway device of claim 10, wherein the first
terminal device is a mobile terminal device, and the
5   gateway device further comprises:
       a handoff control unit configured to transfer the
information regarding the security association to a next
gateway device when the first terminal moves from an area
covered by the gateway device to an area covered by the
10   next gateway device, and to control an operation of the
gateway device according to the information regarding the
security association which is transferred from a previous
gateway device when the first terminal moves from an area
of the previous gateway device to an area covered by the
15   gateway device.

17.   The gateway device of claim 16, wherein the handoff
control unit controls the operation of the gateway device
also according to a state of the transport or upper layer.
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18.   The gateway device of claim 10, further comprising:
       a processing unit configured to obtain decapsulated
data by decapsulating encapsulated data received from the
first terminal device or the second terminal device, judge
25   whether the data relaying at the transport or upper layer
is necessary or not according to the decapsulated data,
control the data relay unit to carry out the data relaying
at the transport or upper layer when the data relaying at
the transport or upper layer is judged as necessary, and
30   encrypt data to be transmitted from the gateway device.

19.   A method for carrying out a data relaying at a
transport or upper layer in a gateway device between a
first terminal device and a second terminal device which
35   are capable of carrying out communications through

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networks, the method comprising:

managing information regarding a security association set up between the first terminal device and the second terminal device in order to carry out communications with guaranteed data secrecy between the first terminal device and the second terminal device;

obtaining decrypted data by decrypting encrypted data received from the first terminal device or the second terminal device, by utilizing the information regarding the security association at a time of relaying the communications with guaranteed data secrecy between the first terminal device and the second terminal device;

carrying out the data relaying at the transport or upper layer according to the decrypted data; and

encrypting data to be transmitted from the gateway device by utilizing the information regarding the security association.

20.   A method for carrying out a data relaying at a transport or upper layer in a gateway device between a first terminal device and a second terminal device which are capable of carrying out communications through networks, the method comprising:

managing information regarding a security association set up between the first terminal device and the second terminal device in order to carry out communications with guaranteed data authenticity between the first terminal device and the second terminal device;

carrying out the data relaying at the transport or upper layer; and

attaching authentication information to data to be transmitted from the gateway device by utilizing the information regarding the security association.

21.   A computer usable medium having computer readable

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program codes embodied therein for causing a computer to
function as a gateway device for carrying out a data
relaying at a transport or upper layer between a first
terminal device and a second terminal device which are
5   capable of carrying out communications through networks,
the computer readable program codes include:
    a first computer readable program code for causing
said computer to manage information regarding a security
association set up between the first terminal device and
10   the second terminal device in order to carry out
communications with guaranteed data secrecy between the
first terminal device and the second terminal device;
    a second computer readable program code for causing
said computer to obtain decrypted data by decrypting
15   encrypted data received from the first terminal device or
the second terminal device, by utilizing the information
regarding the security association at a time of relaying
the communications with guaranteed data secrecy between the
first terminal device and the second terminal device;
20   a third computer readable program code for causing
said computer to carry out the data relaying at the
transport or upper layer according to the decrypted data;
and
    a fourth computer readable program code for causing
25   said computer to encrypt data to be transmitted from the
gateway device by utilizing the information regarding the
security association.

22. A computer usable medium having computer readable
30   program codes embodied therein for causing a computer to
function as a gateway device for carrying out a data
relaying at a transport or upper layer between a first
terminal device and a second terminal device which are
capable of carrying out communications through networks,
35   the computer readable program codes include:

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a first computer readable program code for causing
said computer to manage information regarding a security
association set up between the first terminal device and
the second terminal device in order to carry out
5   communications with guaranteed data authenticity between
the first terminal device and the second terminal device;
a second computer readable program code for causing
said computer to carry out the data relaying at the
transport or upper layer; and
10   a third computer readable program code for causing
said computer to attach authentication information to data
to be transmitted from the gateway device by utilizing the
information regarding the security association.

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